Working with Segmentation and Security for your Nexus Dashboard Enhanced Classic LAN Fabric, Release 4.1.1

Table of Contents

New and changed information

The following table provides an overview of the significant changes up to this current release. The table does not provide an exhaustive list of all changes or of the new features up to this release.

Release Version	Feature	Description
Nexus Dashboard 4.1.1	Improved security and segmentation navigation and workflow.	Beginning with Nexus Dashboard 4.1.1, the navigation and workflow for security and segmentation features in Nexus Dashboard Enhanced Classic LAN fabrics have been enhanced.

Manage segmentation and security

Beginning with Nexus Dashboard release 4.1.1, the navigation and workflow for segmentation and security features in Nexus Dashboard Enhanced Classic LAN fabrics have been enhanced.

To view, edit, or create segmentation and security configurations for a Enhanced Classic LAN fabric:

1. Navigate to the main **Fabrics** window.

   Manage > Fabrics

2. Locate the Enhanced Classic LAN fabric where you want to work with segmentation and security.
3. Single-click the appropriate Enhanced Classic LAN fabric.

   The **Summary** window for that Enhanced Classic LAN fabric appears, with the **Overview** tab selected by default.

4. Click the **Segmentation and security** tab.
5. Determine the area in segmentation and security where you want to work.
   - Working with VRFs
   - Working with networks

View and manage certificates used by Nexus Dashboard

You can view and manage certificates used by Nexus Dashboard through the **Security** page.

To access the **Security** window, navigate to **Admin > Users and Security > Security**. Use these tabs to configure security in this window:

- Security configuration
- Violation action
- Security domains
- JWT keys
- Credentials store

Security configuration

The **Security configuration** page allows you to configure authentication session timeouts and security certificates used by your Nexus Dashboard cluster.

Before you begin

- You must have the keys and certificates you plan to use with Nexus Dashboard already generated.

  Typically, this includes the following files:

  - Private key (nd.key)
  - Certificate Authority's (CA) public certificate (ca.crt)
  - CA-signed certificate (nd.crt)

  Generating these files for self-signed certificates is described in the section " Generating a private key and self-signed certificate" in the Managing Certificates in your Nexus Dashboard.

- We recommend creating a configuration backup of your Nexus Dashboard cluster before making changes to the security configurations.

  For more information about backups, see " Backup and Restore" in Backing Up and Restoring Your Nexus Dashboard.

To edit security configuration:

1. Edit security configuration.
   a. From the main navigation menu, choose **Admin > Users and Security**.
   b. Click the **Security** tab.
   c. In the main pane, click the **Security configuration** tab.
   d. In the main pane, click the **Edit** icon.
2. In the **Edit security configuration** screen that opens, update one or more fields as required:

   Note that uploading the keys and certificate files is not supported and you will need to paste the information in the following fields.

a. Update the **Session timeout**.

   This field defines the duration of the API tokens with the default duration set to 20 minutes.

b. In the **Domain name** field, provide your domain.

c. Check the box in the **Minimum TSL version: TLSV1.3** field if you want to set the minimum SSL version to TLSV1.3.

   The minimum SSL version is set to TLSV1.2 by default. Checking this box to set the minimum version to TLSV1.3 will reject all clients using a TLSV1.2 connection request.

d. To disable Qualtrics integration from the browser at a system wide level, check the box in the **Enforce strict content security policy** field.

e. Click the **SSL Ciphers** field and choose any additional cipher suites you want to enable from the drop-down list or click the **x** icon on an existing cipher suite to remove it.

   Cipher suites define algorithms (such as key exchange, bulk encryption, and message authentication code) used to secure a network connection. This field allows you to customize which cipher suites your Nexus Dashboard cluster will use for network communication and disable any undesired suites, such as the less secure TLS1.2 and TLS1.3.

f. In the **Key** field, provide your private key.

g. In the **RSA Certificate** field, provide the CA-signed or self-signed certificate.

h. In the **Root Certificate** field, provide the CA’s public certificate.

i. (Optional) If your CA provided an Intermediate Certificate, provide it in the **Intermediate Certificate** field.

j. Click **Save** to save the changes.

   After you save your changes, the GUI will reload using the new settings.

Violation action

The **Violation action** window shows the number of unsuccessful attempted login actions.

To edit the information that is provided in the **Violation action** window:

1. From the main navigation menu, choose **Admin > Users and Security**.
2. Click the **Security** tab.
3. In the main pane, click the **Violation action** tab.

   Information on unsuccessful attempted login actions is displayed.

4. Click **Edit**.

   The **Login attempt action** window appears.

5. Edit the **Login attempt action** settings, if necessary.

   a. In the **Maximum login attempts** field, set the maximum number of login attempts until the maximum action is triggered.

      The default entry is 0.

   b. In the **Maximum password length** field, set the maximum password length.

      The default entry is 8.

   c. In the **Maximum login attempted action** field, choose the action that will take place when the number of maximum login attempts has been surpassed.

      - In the **Block for** field, set the amount of time, in seconds, minutes, or hours, that a login block will take place when the number of maximum login attempts has been surpassed.
      - In the **Block admin for** field, set the amount of time, in seconds, minutes, or hours, that an admin login block will take place when the number of maximum login attempts has been surpassed.

6. Click **Save**.

Security domains

A restricted security domain allows an administrator to prevent a group of users from viewing or modifying any objects created by a group of users in a different security domain, even when users in both groups have the same assigned privileges.

For example, an administrator in restricted security domain (domain1) will not be able to see fabrics, services, cluster or user configurations in another security domain (domain2).

Note that a user will always have read-only visibility to system-created configurations for which the user has proper privileges. A user in a restricted security domain can be given a broad level of privileges within that domain without the concern that the user could inadvertently affect another group’s physical environment.

To create a security domain:

1. Create a new security domain.
   a. From the main navigation menu, choose **Admin > Users and Security**.
   b. Click the **Security** tab.
   c. In the main pane, click the **Security domains** tab.
   d. In the main pane, click **Create security domain**.
2. In the **Create security domain** screen that opens, provide the domain details.
   a. Provide the **Name** for the domain.
   b. (Optional) Provide a description for the domain.
   c. Click **Save** to save the domain.

JWT keys

To create a JWT key:

1. From the main navigation menu, choose **Admin > Users and Security**.
2. Click the **Security** tab.
3. In the main pane, click the **JWT keys** tab.
4. Click **Create JWT key**.

   The **Create JWT key** window appears.

5. Enter a service name for the JWT key in the **Service name** field.
6. Enter a JWT API key in the **JWT API key** field.
7. Enter a JWT public key in the **JWT public key** field.
8. Enter the remote ID claim information in the **Remote ID claim** field.
9. Click **Create**.

Credentials store

You can add an external Credentials store that allows you to store and retrieve network credentials from an external vault, such as the CyberArk vault, instead of a local storage system.

To add a credentials store:

1. From the main navigation menu, choose **Admin > Users and Security**.
2. Click the **Security** tab.
3. In the main pane, click the **Credentials store** tab.
4. Click **Add credential store**.

   The **Edit credential store** page appears.

5. In the **Store type** field, choose a store type, such as CyberArk.
6. Enter the necessary information in the remaining fields, depending on the choice that you made in the **Store type** field.

   For example, if you chose CyberArk in the **Store type** field, make the necessary choices in the following fields:

   - In the **CyberArk CCP URL** field, enter the CyberArk Central Credential Provider (CCP) URL.

     For more information, see Central Credential Provider (CCP).

   - In the **Certificate name** field, choose the appropriate certificate from the dropdown list.

     The **Certificate name** field lists the certificates that you configured in **Admin > Certificate Management**.

     > Ensure that the system certificate you configured is mapped to the CyberArk feature to use the certificate name here.

     For more information on system certificates, see Managing Certificates in your Nexus Dashboard.

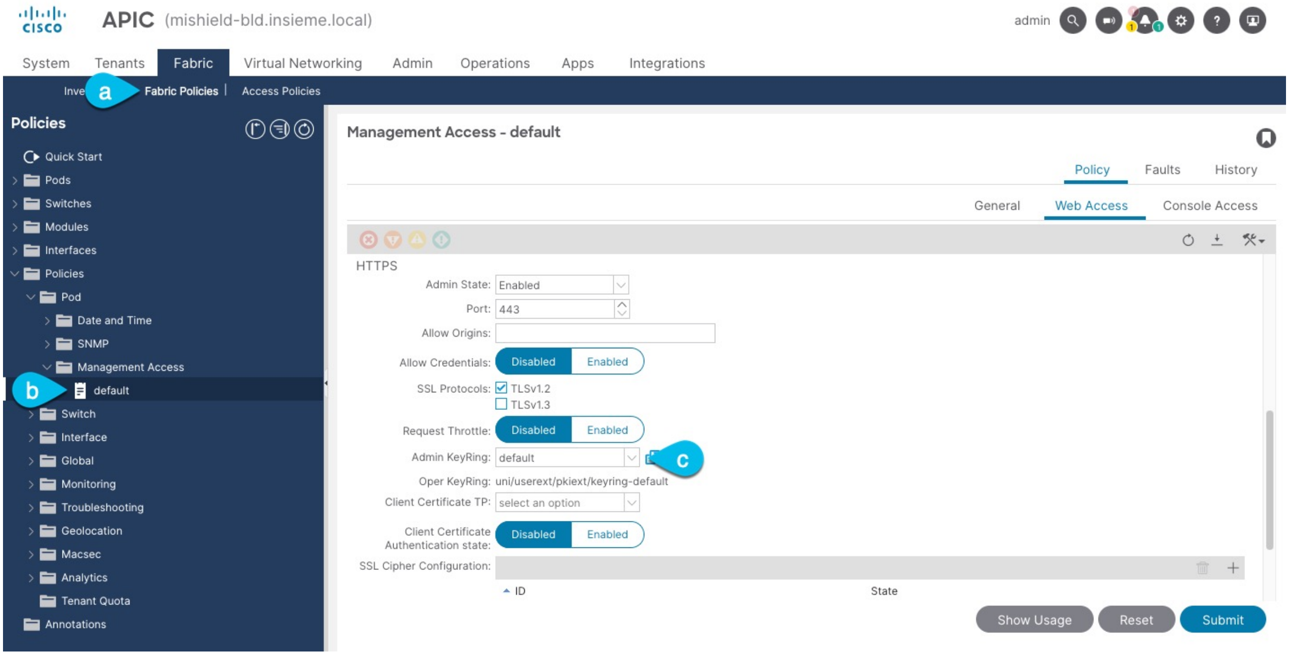
7. Click **Resync/Save**.

Validating peer certificates

You can import a fabric controller’s Certificate Authority (CA) root certificate chain into Nexus Dashboard. This allows you to verify that the certificates of hosts to which your Nexus Dashboard connects (such as fabric controllers) are valid and are signed by a trusted Certificate Authority (CA) when you add the fabrics.

Exporting a certificate chain from Cisco APIC

1. Log in to your Cisco APIC.
2. Check which key ring is being used for management access:



Management Access - default

HTTPS

Admin State: Enabled

Port: 443

Allow Origins:

Allow Credentials: Disabled | Enabled

SSL Protocols: ☑ TLSv1.2 □ TLSv1.3

Request Throttle: Disabled | Enabled

Admin KeyRing: default

Oper KeyRing: uni/userext/pkiext/keyring-default

Client Certificate TP: select an option

Client Certificate Authentication state: Disabled | Enabled

SSL Cipher Configuration:

ID	State

   a. In the top navigation bar, choose **Fabric > Fabric Policies**.

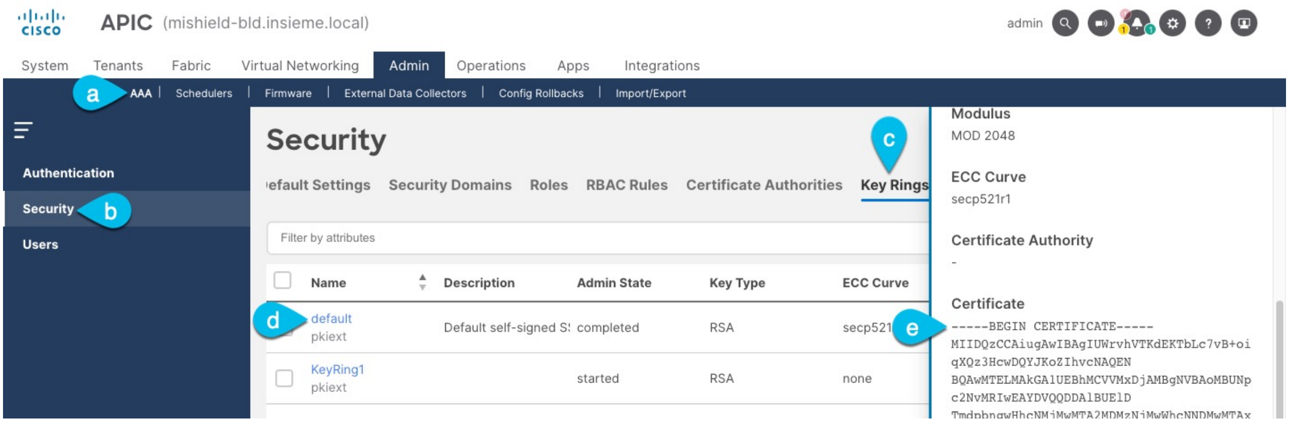
   b. In the left navigation menu, choose **Policies > Pod> Management Access**.

   c. In the main pane, note the name in the **Admin KeyRing** field.

   In the above example, the default key ring is being used. However, if you created a custom key ring with a custom certificate chain, the name of that key ring would be listed in the **Admin KeyRing** field.

   Custom security configuration for Cisco APIC is described in detail in *Cisco APIC Security Configuration Guide* for your release.

3. Export the certificate used by the key ring:



□	Name	Description	Admin State	Key Type	ECC Curve
□	default pkiext	Default self-signed S!	completed	RSA	secp521
□	KeyRing1 pkiext		started	RSA	none

Modulus
MOD 2048

ECC Curve
secp521r1

Certificate Authority
-

Certificate

```
-----BEGIN CERTIFICATE-----
MIIDQzCCAiugAwIBAgIUWrvhVTKdEKTbLc7vB+oi
qXQz3HcwDQYJKoZIhvcNAQEN
BQAwMTELMAkGA1UEBhMCVVMxDjAMBgNVBAoMBUNp
c2NvMRIwEAYDVQQDDAlBUElD
TmdpbnqwHhcNMjMwMTA2MDMzNjMwWhcNNDMwMTAx
```

a. In the top navigation bar, choose **Admin > AAA**.

b. In the left navigation menu, choose **Security**.

c. In the main pane, choose the **Key Rings** tab.

d. Click the name of the key ring you found in the previous step and copy the **Certificate**.

The above example shows the default key ring from the previous step. However, if you had a custom key ring configured, choose the CA certificate chain used to create the key ring.

You must include the -----BEGIN CERTIFICATE----- and -----END CERTIFICATE----- in the text you copy, for example:

```
-----BEGIN CERTIFICATE-----
MIIDQzCCAiugAwIBAgIUWrvhVTKdEKTbLc7vB+oiqXQz3HcwDQYJKoZIhvcNAQEN
[...]
-----END CERTIFICATE-----
```

Importing certificates into Nexus Dashboard

1. Log in to your Nexus Dashboard where you plan to onboard the fabrics.
2. Import the certificate into Nexus Dashboard.
   a. Log in to your Nexus Dashboard where you will onboard the fabrics.
   b. From the main navigation menu, choose **Admin > Certificate Management**.
   c. Click the **CA Certificates** tab.
   d. Click **Add CA certificate**, provide a unique name for the certificate, and paste the certificate chain you copied from your fabric's controller.
3. Proceed with adding the fabric as you typically would, but enable the **Verify Peer Certificate** option.

   Note that if you enable the **Verify Peer Certificate** option but don't import the valid certificate, fabric onboarding will fail.

   Adding fabrics is described in Creating LAN and ACI Fabrics and Fabric Groups.

Working with VRFs

Use the **VRFs** tab to create, edit, delete, attach, detach, import, export, and deploy configurations for VRFs. You can create networks only after creating a VRF except except when creating Layer 2 only networks.

1. In the **Segmentation and security** area, click the **VRFs** subtab.
2. Review the information in the **VRFs** window.

   The **VRFs** window shows information on already-configured VRFs.

View VRF information

1. Review the information provided in the **VRFs** window.

   - The **Config-Sync Status** area above the table provides information on the status of all of the VRF deployments in the fabric.
   - The table provides information on individual VRFs in the fabric.

   VRFs Table Fields and Description

Field	Description
VRF Name	Specifies the name of the VRF.
VRF Status	Specifies whether the status of the VRF deployment as NA, Out of Sync, Pending, Deployed, and so on.

2. Click the gear icon to the right of the table to change the columns in the table.

   Click the toggle switch to enable or disable the column options, including these additional options:

   - Description
   - Default security tag
3. Click the table header to sort the entries in alphabetical order for the selected parameter.
4. Perform any of the following actions in the **VRFs** window.

   The following table describes the action items that are available in the **Actions** drop-down list.

   VRFs Actions and Description

Action Item	Description
Create	Allows you to create a VRF. See Create a VRF for more information.

Action Item	Description
Edit	Allows you to edit the selected VRF. 1. To edit a VRF, choose the check box next to the VRF that you want to edit and choose **Edit**. On the **Edit VRF** page, you can edit the parameters. 2. Click **Save** to retain the changes or click **Close** to discard the changes.
Multi-attach	Allows you to provision the VRF on multiple switches. 1. To attach a VRF, choose the check box next to the VRF that you want to attach the switches to and choose **Multi-attach.** On the **Multi-attach of VRFs** page, you can specify the switches where you want to deploy the VRF. 2. Click **Next** to proceed to the next step in the wizard or click **Cancel** to discard the changes. The **Summary** page displays with the **Proceed to Full Switch Deploy (Recommended)** button selected. 3. Click **Save**. The **Deploy Configuration** page appears. 4. Click **Deploy All**. The **Deploy Configuration** page appears with an updated status of **SUCCESS**, **Status Description**, and **Progress** indicator. 5. Click **Close**. The attached VRF displays as **DEPLOYED** in the **VRF Status** column.

Action Item	Description
Multi-detach	Allows you to remove the VRF configuration from the selected switches. 1. To detach a VRF, choose the check box next to the VRF that you want to detach and choose **Multi-detach**. On the **Multi-detach of VRFs** page, you can specify the switches where you want to remove the VRF configuration. 2. Choose the check box for the switch that you want to detach from the VRF. 3. Click **Next**. The **Summary** page displays with the **Proceed to Full Switch Deploy (Recommended)** button selected. 4. Click **Save**. The **Deploy Configuration** page appears with the selected switch. 5. Click **Deploy All**. Click **Close**.
Deploy	Allows you to deploy the configuration for the selected VRF. 1. To deploy a VRF configuration, choose the check box next to the VRF for which you want to deploy the configuration and choose **Deploy**. On the **Deploy Configuration** page, you can deploy the specified VRF configuration. 2. Click **Deploy** or click **Close** to discard the changes.
Import	Allows you to import VRF information from a .csv file for the fabric. 1. To import VRF information from a .csv file, choose **Import**. The **Import VRFs** dialog box appears. 2. Browse to the directory and select the .csv file that contains the VRF information. 3. Click **OK**. The VRF information is imported and displayed on the **VRFs** page.

Action Item	Description
Export	Allows you to export VRF information to a .csv file. The exported .csv file will then contain information pertaining to each VRF, including the configuration details that you saved during the creation of the VRF. To export VRF information, choose **Export**. The VRF .csv file is exported to your local directory. The file name is appended with the date and time at which the file was exported. ℹ You can use the exported .csv file for reference or use it as a template for creating new VRFs.
Delete	Allows you to delete a selected VRF. You can select multiple VRF entries and delete them at the same time. 1. To delete a VRF, choose the check box next to the VRF that you want to delete and choose **Delete**. A warning message appears asking whether you want to delete the VRF(s). 2. Click **Confirm** to delete or click **Cancel** to retain the VRF. A message appears that the selected VRFs are deleted successfully.

Create a VRF

1. In the **VRFs** window, click **Create**.

   The **Create VRF** page appears.

2. On the **Create VRF** page, enter the required details in the mandatory fields. The available fields vary based on the fabric type.

Field	Description
VRF Name	Specifies a VRF name automatically or allows you to enter a name. The VRF name should not contain any white spaces or special characters except underscore (_), hyphen (-), and colon (:).
VRF Template	A default universal template is auto-populated. This is applicable for leaf switches only.

3. Enter the necessary field values or edit pre-filled fields, as required.

   The tabs and their fields on the page are explained in the following sections.

   - General Parameters
   - Advanced

4. Click **Create** to create the VRF or click **Close** to discard the VRF.

A message appears indicating that the VRF is created.

The new VRF appears on the **VRFs** horizontal tab. The status is shown as **NA** because the VRF is created but is not yet deployed. Double-click on the configured VRF to bring up the **VRF Attachments** information.

> ℹ If you did not associate a VLAN with a VRF when you created the VRF using these instructions, you will see NA displayed in the **VRF Attachments** for the VRF, even if a VLAN was associated with the VRF through another process (for example, if you disabled the **Enable L3VNI w/o VLAN** setting).

Now that the VRF is created, you can create and deploy networks on the devices in the fabric.

General Parameters

The **General Parameters** tab is displayed by default. The fields in this tab are described in the following table.

Field	Description
Routing Protocol	Specifies the VRF-Lite Agg-Core/Edge or Collapsed Core-WAN peering protocol options. Options are: · **ebgp** · **ospf** · **none**: Nexus Dashboard does not configure the peering protocol if the **none** option is selected. You must manually configure the peering protocol with this option, if necessary.
IP Version	Select the IP version for VRF Lite. Options are: · **IPv4_only** · **IPv6_only** · **IPv4_and_IPv6**
OSPF Process Tag	This field becomes editable if you selected **ospf** in the **Routing Protocol** field under the General Parameters tab. The OSPF Routing Process Tag. Maximum size is 20.
OSPF Area ID	This field becomes editable in these conditions: · If you selected **ospf** in the **Routing Protocol** field under the General Parameters tab. · If you enter a value in the **OSPF Process Tag** field above. The **OSPF Area ID** in an IP address format.
OSPFv3 Process Tag	This field becomes editable if you selected **ospf** in the **Routing Protocol** field under the General Parameters tab. The **OSPFv3 Routing Process Tag**. Maximum size is 20.

Field	Description
OSPFv3 Area ID	This field becomes editable in these conditions: - If you selected **ospf** in the **Routing Protocol** field under the General Parameters tab. - If you enter a value in the **OSPFv3 Process Tag** field above. The **OSPFv3 Area ID** in an IP address format.
VRF Description	Provide a description of the VRF, if necessary.
Enable Auto Peering over SVI Between vPC Aggregations	Choose the check box to control per VRF iBGP/OSPF peering between Aggregations. The protocol to use is based on the VRF Lite routing protocol setting that you provided in **Fabric Settings**.
VRF Interface MTU	Specifies the VRF interface MTU.

Advanced

Field	Description
Redistribute Direct Route Map	Specifies the redistribute direct route map name.
Max BGP Paths	Specifies the maximum number of BGP paths. The valid value is between 1 and 64.
Static Route Information	Provides the static route information for the VRF. Click Actions > Add to add static route information for the VRF.
Config Static 0/0 Route	Choose this check box to control configuration of static default route.
Enable BGP Authentication	Choose this check box to enable BGP authentication.
BGP Password Key Encryption Type	From the drop-down list, select the encryption type.
BGP Neighbor Password	Specifies the VRF-Lite BGP neighbor password.
Enable OSPF Authentication	Select the check box to enable OSPF authentication. Deselect the check box to disable it. If you enable this field, the OSPF Authentication Key ID and OSPF Authentication Key fields get enabled.
OSPF Authentication Key ID	The Key ID is populated.
OSPF Authentication Key	The OSPF authentication key must be the 3DES key from the switch. ℹ Plain text passwords are not supported. Log in to the switch, retrieve the encrypted key and enter it in this field. Refer, *Retrieving the Authentication Key* section for details.
Enable Netflow	Allows you to enable netflow monitoring on the VRF-Lite sub-interface. Note that this is supported only if netflow is enabled on the fabric.

Field	**Description**
Netflow Monitor	Specifies the monitor for the VRF-Lite netflow configuration. To enable netflow on a VRF-Lite sub-interface, you must enable netflow at the VRF level and VRF extension level. Check the **Enable_IFC_Netflow** check box in the VRF attachment while you edit an extension to enable netflow monitoring. For more information, see the " Configuring Netflow support" section in Creating LAN and ACI Fabrics and Fabric Groups.
NetFlow Sampler	Specify the name of the Netflow sampler. The **Netflow Sampler** is applicable to Cisco Nexus 7000 Series switches only.

VRF attachments

Use this window to attach or detach attachments to or from a VRF, respectively. You can also import or export the attachments for a VRF.

VRF Attachments Table Fields and Description

Field	Description
VRF Name	Specifies the name of the VRF.
VRF ID	Specifies the ID of the VRF.
VLAN ID	Specifies the VLAN ID.
Switch	Specifies the name of the switch.
Status	Specifies the status of VRF attachments, for example, pending, NA, deployed, out-of-sync, and so on.
Attachment	Specifies whether the VRF attachment is attached or detached.
Switch Role	Specifies the switch role. For example, for the fabric created using the Campus VXLAN EVPN fabric template, the switch role is specified as either leaf, spine, or border.
Fabric Name	Specifies the name of the fabric to which the VRF is attached or detached.
Loopback ID	Specifies the loopback ID.
Loopback IPV4 Address	Specifies the loopback IPv4 address.
Loopback IPV6 Address	Specifies the loopback IPv6 address. The IPv6 address is not supported for underlay.

Click the table header to sort the entries in alphabetical order of that parameter.

The following table describes the action items, in the **Actions** drop-down list, that appears on the **VRF Attachments** horizontal tab of the **VRFs** tab in the **Fabric Overview** window.

VRF Attachments Actions and Description

Action Item	**Description**
History	Allows you to view the deployment and policy change history of the selected VRF. You can view the deployment history details of a VRF attachment such as hostname, VRF name, commands, status, status description, user, and completed time on the **Deployment History** tab. You can view the policy change history details such as policy ID, template, description, PTI operation, generated configuration, entity name and type, created date, serial number, user, and source of the policy on the **Policy Change History** tab. To view the history of a VRF attachment, check the check box next to the VRF name and select **History**. The **History** window appears. Click the **Deployment History*or *Policy Change History** tabs as required. You can also click the **Detailed History** link in the **Commands** column of the **Deployment History** tab to view the command execution details (comprising configuration, status, and CLI response) for the host.
Edit	Allows you to view or edit the VRF attachment parameters such as interfaces that you want to attach to the selected VRF. To edit the VRF attachment information, check the check box next to the VRF name that you want to edit. Select **Edit**. In the **Extension*window, edit the required values, attach or detach the VRF attachment. Click the *Edit** link to edit the CLI freeform config for the switch, and click **Save** to apply the changes or click **Cancel** to discard the changes. The edited VRF attachment is shown in the table on the **VRF Attachments** horizontal tab of the **VRFs** tab in the **Fabric Overview** window.

Action Item	Description
Preview	Allows you to preview the configuration of the VRF attachments for the selected VRF. ℹ This action is not allowed for attachments that are in deployed or NA status. To preview the VRF, check the check box next to the VRF name and choose **Preview** from **Actions** drop-down list. The **Preview Configuration** window for the fabric appears. You can preview the VRF attachment details such as the VRF name, fabric name, switch name, serial number, IP address, and role, VRF status, pending configuration, and progress of the configuration. Click the lines link in the **Pending Config** column to view the lines for which the configuration is pending. Click **Close**.
Deploy	Allows you to deploy the pending configuration of the VRF attachments, for example, interfaces, for the selected VRF. ℹ This action is not allowed for attachments that are in deployed or NA status. To deploy a VRF, check the check box next to the VRF name and choose **Deploy** from **Actions** drop-down list. The **Deploy Configuration** window for the fabric appears.You can view the details such as the VRF name, fabric name, switch name, serial number, IP address, and role, VRF status, pending configuration, and progress of the configuration. Click the lines link in the **Pending Config** column to view the lines for which the configuration is pending. Click the **Deploy** button. The status and progress of the deployment is displayed in the **VRF Status** and **Progress** columns. After the deployment is completed successfully, close the window.

Action Item	Description
Import	Allows you to import information about VRF attachments for the selected fabric. To import the VRF attachments information, choose **Import**. Browse the directory and select the .csv file that contains the VRF attachments information. Click **Open** and then click **OK**. The VRF information is imported and displayed in the **VRF Attachments** horizontal tab on the **VRFs** tab in the **Fabric Overview** window.
Export	Allows you to export the information about VRF attachments to a .csv file. The exported file contains information pertaining to each VRF, including the fabric it belongs to, whether the LAN is attached, the associated VLAN, serial number, interfaces, and freeform configuration details that you saved for VRF attachments. To export VRF attachments information, choose the **Export** action. Select a location on your local system directory to store the VRF information and click **Save**. The VRF information file is exported to your local directory. The file name is appended with the date and time at which the file was exported.
Quick attach	Allows you to immediately attach an attachment to the selected VRF. You can select multiple entries and attach them to a VRF at the same instance. To quickly attach any attachment to a VRF, choose **Quick attach** from **Actions** drop-down list. A message appears to inform that the attach action was successful.
Quick detach	Allows you to detach the selected VRF immediately from an attachment, for example, a fabric. You can select multiple entries and detach them from an attachment at the same instance. To attach any attachment to a VRF quickly, choose **Quick detach** from **Actions** drop-down list. A message appears to inform that the detach action was successful.

Working with networks

1. In the **Segmentation and security** area, click the **Networks** subtab.
2. Review the information in the **Networks** window.

   The **Networks** window shows information on already-configured networks.

   > Before creating networks, ensure that you have created a VRF for the fabric. However, if you have chosen Layer 2, you do not require a VRF. For more information about VRFs, see Working with VRFs.

To create overlay networks, create networks for the fabric and deploy them on the fabric switches. Before deploying the networks, set the overlay mode. For more information on how to choose the overlay mode, see the section " Overlay Mode" in Understanding LAN Fabrics.

For more information on creating interface groups and attaching networks, see the section " Interface Groups" in Add Interfaces: LAN.

You can view the network details in the **Networks** tab and network attachment details in the **Network attachments** tab.

View network information

1. Review the information provided on the **Networks** page.

   The table provides information on individual networks in the fabric.

   Networks Table Fields and Description

Field	Description
Network Name	Specifies the name of the network.
VRF Name	Specifies the name of the VRF that’s associated with the network.
IPv4 Gateway Address/Prefix	Specifies the IPv4 address with a prefix.
IPv6 Gateway Address/Prefix	Specifies the IPv6 address with a prefix.
Network Status	Specifies the status of the network deployment as **NA**, **Out of Sync**, **Pending**, **Deployed**, and so on.
VLAN ID	Specifies the VLAN ID for the network.
VLAN Name	Specifies the name of the VLAN.
Interface Group	Specifies the interface group.

2. Click the gear icon to the right of the table to change the columns in the table.
3. Click the toggle switch to enable or disable the column options.
4. Click **Filter by attributes** to filter information based on the chosen parameter.
5. Click the column header to sort the entries in alphabetical order for the chosen parameter.

6. Perform any of these actions on the **Networks** page.

   This table describes the action items that are available in the **Actions** drop-down list.

Networks Actions and Description

Action Item	Description
Create	Allows you to create a network.
Edit	Allows you to view or edit the selected network parameters. 1. To edit the network information, check the check box next to the network name that you want to edit and choose **Edit**. 2. On the **Edit Network** page, edit the required values and click **Save** to apply the changes or click **Close** to discard the changes.
Multi-attach	Allows you to attach networks to multiple switches and interfaces at the same time. 1. To attach the selected switches and interfaces to the network, check the check box next to the network name that you want to attach and choose **Multi-attach**. 2. On the **Multi-attach of Networks** page, check the check boxes for the switches that you want to attach to the network and click **Next**. 3. In the **Select Interfaces** area, check the check boxes for the interfaces that you want to attach to the network and click **Next**. The **Summary** page displays with the **Proceed to Full Switch Deploy (Recommended)** option selected. 4. Click **Save**. The **Deploy Configuration** page appears with the selected switch. 5. Click **Deploy All**. The **Deploy Configuration** page appears with an updated status of **SUCCESS**, **Status Description**, and **Progress** indicator. 6. Click **Close**. The attached network displays as **DEPLOYED** in the **Network Status** column in the **Networks** tab.

Action Item	Description
Multi-detach	Allows you to detach multiple switches from the network at the same time. 1. To detach the selected switches from the network, select the check box next to the network name that you want to detach and choose **Multi-detach**. 2. On the **Multi-detach of Networks** page, check the check boxes for the switches that you want to detach from the network and click **Next**. The **Summary** page displays with the **Proceed to Full Switch Deploy (Recommended)** option selected. 3. Click **Save**. The **Deploy Configuration** page appears with the selected switch. 4. Click **Deploy All**. The **Deploy Configuration** page appears with an updated status of **SUCCESS**, **Status Description**, and **Progress** indicator. 5. Click **Close**. The detached network displays as **NA** (not attached) in the **Network Status** column in the **Networks** tab.
Deploy	Allows you to deploy the pending configuration for associating the switches or interfaces to the network. 1. To deploy a network, check the check box next to the network name that you want to deploy and choose **Deploy**. The **Deploy Configuration** page for the fabric appears. You can view the details such as the network name, fabric name, switch name, serial number, IP address, and role, network status, pending configuration, and progress of the configuration. 2. Click the **Lines** link in the **Pending Config** column to view the lines of the pending configuration. The **Pending Config** dialog box appears. 3. Click **Cancel** after you have viewed the pending configuration. 4. On the **Deploy Configuration** page, click the **Deploy** button. The status and progress of the deployment displays in the **Network Status** and the **Progress** columns. 5. After the deployment completes successfully, close the page.

Action Item	Description
Import	Allows you to import network information for the fabric. 1. To import network information, choose **Import**. The **Import Networks** dialog box appears. 2. Browse to the directory with the .csv file that contains the host IP address and corresponding unique network information. 3. Click **OK**. The host aliases are imported and displayed in the **Networks** tab.
Export	Allows you to export network information to a .csv file. The exported file contains information pertaining to each network, including the fabric it belongs to, the associated VRF, the network templates used to create the network, and all other configuration details that you saved during network creation. You can use the exported .csv file for reference or use it as a template for creating new networks. 1. To export network information, choose **Export**. The network information file is exported to your local directory. The file name is appended with the date and time at which the file was exported. ℹ The **Networks** tab displays network names based on the number of rows per page. You can view network names based on the options in the **Rows per page** drop-down list. When you use the **Export** option, Nexus Dashboard exports the network names as displayed per page. If you have a large number of network names and you want to export all of your network names, you need to navigate to each page and export each page individually. 2. Before importing the file, update new records in the .csv file. 3. Ensure that the **networkTemplateConfig** field contains the JSON Object.
Delete	Allows you to delete the network. You can select multiple network entries and delete them at the same time. 1. To delete a network for the fabric, select the check box next to the network name that you want to delete and choose **Delete**. A **Warning** dialog box appears. 2. Click **Confirm** to delete the network.

Action Item	Description
Add to interface group	Allows you to add the network to an interface group. You can choose multiple network entries and add them to an interface group at the same time. 1. To associate the selected networks to the interface group that you want, check the check box for the network name you want and click **Add to interface group**. 2. On the **Add to interface group** page, click the network that you want to add and verify whether the selected network is present on the **Selected Networks** page and then click **Cancel**. 3. Either choose an **Interface Group** from the drop-down list or click **Create interface group**. 4. On the **Create interface group** page, provide the interface group name, choose the interface type, and then click **Create** to save the changes or click **Close** to close the page and discard the changes. 5. On the **Add to interface group** page, click **Save** to save the changes or click **Close** to close the page and discard the changes. The interface group displays in the **Interface Group** column on the **Networks** tab.

Create a network

Before creating networks, ensure that you have created a VRF for the fabric. However, if you have chosen Layer 2 on the **Create Network** page, then you do not require a VRF. For more information, see Working with VRFs.

1. In the **Networks** window, click **Create network**.

   The **Create network** page appears.

2. On the **Create Network** page, enter the required details in the mandatory fields. The available fields vary based on the fabric type.

Field	Description
Network Name	Specifies the name of the network. The network name should not contain any white spaces or special characters, except underscore (_) and hyphen (-).
Layer 2 Only	Specifies whether the network is Layer 2 only.
VRF Name	Allows you to select the Virtual Routing and Forwarding (VRF) from the drop-down list. If you want to create a new VRF, click **Create VRF**. The VRF name should not contain any white spaces or special characters except underscore (_), hyphen (-), and colon (:).

VLAN ID	Specifies the corresponding tenant VLAN ID for the network. If you want to propose a new VLAN for the network, click **Propose VLAN**.
Network Template	A default universal template is auto-populated. This is only applicable for leaf switches.

3. Enter the necessary field values or edit pre-filled fields, as required.

   The tabs and their fields in the screen are explained in the following sections.

   - General Parameters
   - Advanced

4. Click **Create**.

   A message appears indicating that the network is created.

   The new network appears on the **Networks** page that comes up.

   The Status is **NA** since the network is created but not yet deployed on the switches. Now that the network is created, you can create more networks if necessary and deploy the networks on the devices in the fabric.

General Parameters

The fields on the **General Parameters** tab are:

Field	Description
IPv4 Gateway/NetMask	Specifies the IPv4 address with subnet. Specify the anycast gateway IP address for transporting the L3 traffic from a server belonging to MyNetwork_30000 and a server from another virtual network. The anycast gateway IP address is the same for MyNetwork_30000 on all switches of the fabric that have the presence of the network. ℹ If the network is a non-Layer 2 network, then it is mandatory to provide the gateway IP address. ℹ If the same IP address is configured in the IPv4 Gateway and IPv4 Secondary GW1 or GW2 fields of the network template, Nexus Dashboard does not show an error, and you will be able to save this configuration. However, after the network configuration is pushed to the switch, it would result in a failure as the configuration is not allowed by the switch.
Interface IPv4 addr on active	Specify the interface IP address on the active/master device. For example, 192.0.2.2.
Interface IPv4 addr on standby	Specify the interface IP address on the standby/backup device. For example, 192.0.2.3.

Field	Description
IPv6 Gateway/Netmask	Specifies the IPv6 address with subnet.
Interface IPv6 addr on active	Specify the interface IPv6 address on the active/master device. For example, 192.0.2.2.
Interface IPv6 addr on standby	Specify the interface IPv6 address on the standby/backup device. For example, 192.0.2.3.
IPv6 Link local address	Specify the primary virtual link-local IPv6 address used in VRRPv3 (mandatory for IPv6 VRRPv3).
VLAN Name	Enter the VLAN name.
Interface Description	Specifies the description for the interface. This interface is a switch virtual interface (SVI).
Standby Interface Description	Specifies the description for the interface on the standby/backup switch.
MTU for L3 interface	Enter the MTU for Layer 3 interfaces range 68 - 9216.
Routing Tag	Enter the routing tag. The value should match the 'Route-Map Tag' in **Fabric Settings** for routes to be advertised within the fabric. Valide entries: 0-4294967295 or blank.

Advanced

The fields on the **Advanced** tab are:

Field	Description
First Hop Redundancy Protocol	Specifies the FHRP protocol. Options are: • **none**: Select this option if you want Layer 2 only. • **hsrp** • **vrrp** • **vrrpv3**
ARP Suppression	Select the check box to enable the ARP Suppression function.
Ingress Replication	The check box is selected if the replication mode is ingress replication. ℹ Ingress replication is a read-only option on the **Advanced** tab. Changing the fabric setting updates the field.

Field	Description
Multicast Group Address	The multicast IP address for the network is autopopulated. Multicast group address is a per fabric instance variable. The number of underlay multicast groups supported is 128. If all networks are deployed on all switches, you need not use a different multicast group per L2 VNI or a network. Therefore, multicast group for all networks in a fabric remains same. A maximum of 16 DHCP relay servers for overlay networks are supported. Perform the following steps to include the DHCP relay server information: a. On the **DHCP Relay Server Information** field, click **Actions** > **Add**. The **ADD Item** page appears. b. Enter the **Server IP V4 Address** and **Server VRF** details and click **Save**. c. Repeat the above steps to add the required number of DHCP relay server information.
DHCPv4 Server 3	Enter the DHCP relay IP address of the next DHCP server.
DHCPv4 Server3 VRF	Enter the DHCP server VRF ID.
Loopback ID for DHCP Relay interface (Min:0, Max:1023)	Specifies the loopback ID for DHCP relay interface.
Routing Tag	The routing tag is autopopulated. This tag is associated with each gateway IP address prefix.
IPv4 TRM enable	Check the check box to enable TRM with IPv4. For more information, see the " Overview of Tenant Routed Multicast" section in Editing Data Center VXLAN EVPN Fabric Settings.
IPv6 TRM enable	Check the check box to enable TRM with IPv6. For more information, see the " Overview of Tenant Routed Multicast" section in Editing Data Center VXLAN EVPN Fabric Settings.
L2 VNI Route-Target Both Enable	Check the check box to enable automatic importing and exporting of route targets for all L2 virtual networks.
Enable Netflow	Enables netflow monitoring on the network. This is supported only if netflow is already enabled on fabric.
Interface Vlan Netflow Monitor	Specifies the netflow monitor specified for Layer 3 record for the VLAN interface. This is applicable only if **Is Layer 2 Record** is not enabled in the **Netflow Record** for the fabric.
Vlan Netflow Monitor	Specifies the monitor name defined in the fabric setting for Layer 3 **Netflow Record**.
Enable L3 Gateway on Border	Check the check box to enable a Layer 3 gateway on the border switches.

Network attachments

The following options are applicable only for switch fabrics, Easy fabrics, and MSD fabrics:

- Choose **Manage > Fabrics**. Click on the fabric to open the **Fabric** slide-in pane. Click the **Launch** icon. Choose **Fabric Overview > Networks > Network attachments**.
- Choose **Manage > Fabrics**. Double-click on the fabric to open **Fabric Overview > Networks > Network attachments**.

Use this window to attach fabrics and interfaces to a network.

Network Attachments Table Fields and Description

Field	Description
Network Name	Specifies the name of the network.
Network ID	Specifies the Layer 2 VNI of the network.
VLAN ID	Specifies the VLAN ID.
Switch	Specifies the name of the switch.
Ports	Specifies the ports for the interfaces.
Status	Specifies the status of the network attachments, for example, pending, NA, and so on.
Attachment	Specifies whether the network attachment is attached or detached.
Switch Role	Specifies the switch role. For example, for the fabric created using the Campus VXLAN EVPN fabric template, the switch role is specified as either leaf, spine, or border.
Fabric Name	Specifies the name of the fabric to which the network is attached or detached.

The following table describes the action items, in the **Actions** drop-down list, that appears in the **Network attachments** horizontal tab on the **Networks** tab in the **Fabric Overview** window.

Network Attachments Actions and Description

Action Item	Description

History	Allows you to view the deployment and policy change history of the selected network. You can view the deployment history details of a network attachment such as hostname, network name, VRF name, commands, status, status description, user and completed time on the **Deployment History** tab. You can view the policy change history details such as policy ID, template, description, PTI operation, generated configuration, entity name and type, created date, serial number, user, and source of the policy on the **Policy Change History** tab. To view the history of a network attachment, select the check box next to the network name and choose the **History** action. The **History** window appears. Click the **Deployment History** or **Policy Change History** tabs as required. Click the **Detailed History** link in the **Commands** column of the **Deployment History** tab to view the command execution details (comprising configuration, status, and CLI response) for the host.
Edit	Allows you to view or edit the network attachment parameters such as interfaces that you want to attach to the selected network. To edit the network attachment information, check the check box next to the network name that you want to edit and choose the **Edit** action. In the **Edit Network Attachment** window, edit the required values, attach or detach the network attachment, click the **Edit** link to edit the CLI freeform config for the switch, and click **Save** to apply the changes or click **Cancel** to discard the changes. The edited network attachment is shown in the table on the **Network attachments** horizontal tab of the **Networks** tab in the **Fabric Overview** window.

Preview	Allows you to preview the configuration of the network attachments for the selected network. This action is not allowed for attachments that are in deployed or NA status. To preview the network, check the check box next to the network name and choose **Preview** from **Actions** drop-down list. The **Preview Configuration** window for the fabric appears. You can preview the network attachment details such as the network name, fabric name, switch name, serial number, IP address, and role, network status, pending configuration, and progress of the configuration. Click the lines link in the **Pending Config** column to view the lines for which the configuration is pending. Click **Close**.
Deploy	Allows you to deploy the pending configuration of the network attachments, for example, interfaces, for the selected network. This action is not allowed for attachments that are in deployed or NA status. To deploy a network, check the check box next to the network name and choose **Deploy** from **Actions** drop-down list. The **Deploy Configuration** window for the fabric appears. You can view the details such as the network name, fabric name, switch name, serial number, IP address, and role, network status, pending configuration, and progress of the configuration. Click the lines link in the **Pending Config** column to view the lines for which the configuration is pending. Click the **Deploy** button. The status and progress of the deployment is displayed in the **Network Status** and **Progress** columns. After the deployment is completed successfully, close the window.

Import	Allows you to import information about network attachments for the selected fabric. To import the network attachments information, choose **Import**. Browse the directory and select the .csv file that contains the network attachments information. Click **Open** and then click **OK**. The network information is imported and displayed in the **Network attachments** horizontal tab on the **Networks** tab in the **Fabric Overview** window.
Export	Allows you to export the information about network attachments to a .csv file. The exported file contains information pertaining to each network, including the fabric it belongs to, whether the LAN is attached, the associated VLAN, serial number, interfaces, and freeform configuration details that you saved for network attachments. To export network attachments information, choose the **Export** action. Select a location on your local system directory to store the network information and click **Save**. The network information file is exported to your local directory. The file name is appended with the date and time at which the file was exported.
Quick attach	Allows you to immediately attach an attachment to the selected network. You can select multiple entries and attach them to a network at the same instance. ℹ Interfaces cannot be attached to a network using this action. To quickly attach any attachment to a network, choose **Quick attach** from **Actions** drop-down list. A message appears to inform that the attach action was successful.

Quick detach	Allows you to immediately detach the selected network from an attachment, for example, a fabric. You can select multiple entries and detach them from an attachment at the same instance. To quickly detach any attachment to a network, choose **Quick detach** from **Actions** drop-down list. A message appears to inform that the detach action was successful. After quick detach, the switch status is not computed when there is no deploy. Post deploy, the configuration compliance calls at entity level (interface or overlay).

Private VLANs

A Private Virtual Local Area Network (PVLAN) is a VLAN that isolates a Layer 2 port from the other ports in the same broadcast domain or subnet. PVLAN restricts Layer 2 traffic within a broadcast domain by segmenting the broadcast domain into multiple subdomains. A subdomain contains a PVLAN pair which includes a primary VLAN and one or more secondary VLANs. A PVLAN domain can have multiple PVLAN pairs, one for each subdomain. All VLAN pairs in a PVLAN domain share the same primary VLAN. A PVLAN domain can have only one primary VLAN.

Secondary VLANs provide Layer 2 isolation between ports within the same PVLAN. Although PVLANs provide host isolation at Layer 2, hosts can communicate with each other at Layer 3.

Guidelines and Limitations for Private VLANs over VXLAN

- This feature is supported with Data Center VXLAN EVPN, BGP, and External fabrics.
- This feature is supported over physical interface, port-channel interface and virtual port channel (vPC) interfaces on the switches in a fabric.
- This feature is supported on Layer 2 ToR interfaces.
- This feature provides support for **cli** and **config-profile** overlay modes for VRF and network configuration.
- This feature is supported only on VTEPs, and not supported on spine and super spine switches.
- This feature is not supported with the VXLAN EVPN Multi-site fabrics.
- This feature is not supported on Brownfield deployments.
- This feature is not supported on Interface groups on PVLAN interface.

Enable PVLAN for a Fabric

1. In Cisco Nexus Dashboard, choose **Manage > Fabrics**.
2. Choose **Actions > Create Fabric** and select the required template and click **Select**.

   To enable PVLAN on an existing fabric, select the fabric name and choose **Actions > Edit Fabric**.

3. Go to the **Advanced** tab and check the **Enable Private VLAN (PVLAN)** checkbox.

Ensure that you have checked the **Enable EVPN VXLAN Overlay** check box in the **EVPN** tab of the BGP fabric. You can enable the **Enable Private VLAN (PVLAN)** checkbox only if you have enabled VXLAN EVPN mode in your fabric.

4. From the **PVLAN Secondary Network Template** list, select PVLAN template for the secondary network. The default is **Pvlan_Secondary_Network**.
5. Click **Save**.

   A warning message appears prompting you to perform a Recalculate and deploy.

6. Click **OK**.
7. Double-click the fabric to open the **Fabric Overview** window.
8. Choose **Actions > Recalculate and deploy**.
9. Review the configurations after the **Config Preview** and click **Deploy All**.

   Performing a relcalculate and deploy enables ***feature private-vlan*** command on all the VTEPs and TORs.

   You cannot disable PVLAN feature in a fabric, if there are any PVLAN networks or PVLAN interface policies configured.

Configure an interface as a PVLAN port

Before you begin

Ensure that you have enabled PVLAN feature for the fabric.

Perform the following steps to configure a PVLAN port:

1. In Cisco Nexus Dashboard, choose **Manage > Fabrics**.
2. Double-click the fabric name to open the **Fabric Overview** page.
3. On the **Interfaces** tab, do one of the following:
   - For an Ethernet interface, select the required interface and choose **Actions > Edit**.
   - For a Port Channel or virtual Port Channel (vPC) interface, choose **Actions > Create interface**.
4. Under the **Policy** field, click the policy link to select the required PVLAN interface policy.
5. In the **Select Attached Policy Template** dialog box, choose the required interface policy template and click **Select**.

   The following are the supported PVLAN interface policies:

   - **int_pvlan_host**: Specifies the interface template for creating a PVLAN port on an Ethernet interface.
   - **int_port_channel_pvlan_host**: Specifies the interface template for creating a PVLAN port-channel interface.
   - **int_vpc_pvlan_host**: Specifies the interface template for creating a vPC port for the PVLAN on a vPC pair.

     After attaching the PVLAN policy to an interface, the **PVLAN** tab appears.

6. Configure all the necessary fields in the **PVLAN** tab.

   The fields in the **PVLAN** tab are described in the following table.

Field	Description
PVLAN Mode	Specifies the PVLAN port type. The following are the supported types: · **promiscuous** · **trunk promiscuous** · **host** · **trunk secondary**
PVLAN Allowed Vlans	Configures a list of allowed VLANs on a PVLAN trunk port.
Native Vlan	Configures a VLAN to transport the untagged packets on PVLAN trunk ports. If there is no native VLAN configured, all untagged packets are dropped.
PVLAN Mapping	Displays the mapping between the primary VLAN and the secondary VLANs. The fields in this area are enabled only if you select **promiscuous** or **trunk promiscuous** as the PVLAN mode. You can configure multiple VLAN pairs for the PVLAN. To add new primary-secondary VLAN pair, choose **Actions > Add**.
PVLAN Association	Configures the association between the primary VLAN and the associated secondary VLANs. The fields in this area are enabled only if you select **host** or **trunk secondary** as the PVLAN mode. You can configure multiple VLAN pairs for the PVLAN. To add a new primary-secondary VLAN pair, choose **Actions > Add**.

7. When you have entered all the necessary information in the configuration fields, click **Save**.

   An error message appears if you have not enabled PVLAN for the fabric. See Enable PVLAN for a Fabric for the steps to enable PVLAN for the fabric.

For external fabrics, Cisco Nexus Dashboard provides support for PVLAN only at the interface level. Before configuring PVLAN interfaces, if **feature private-vlan** is not already enabled on the switch, ensure that you add a PVLAN policy for the switch using the **feature-pvlan** policy template. Perform a **Recalculate and deploy** and then follow the steps mentioned in this section to create PVLAN interfaces.

Create a network for primary and secondary VLANs

1. In Cisco Nexus Dashboard, choose **Manage > Fabrics**.
2. From the list of available fabrics, double-click the PVLAN-enabled fabric.

   The **Fabric Overview** page appears.

3. Navigate to the **Networks** tab and choose **Actions > Create**.

   The **Create Network** window appears.

4. Enter the required details in the following fields. Some of the fields are auto-populated with default values. You can make changes, as required.

   The fields in the **Create Network** window are:

Field	Description
Network Type	Click the **Private (PVLAN)** radio button. This radio button is available only if you have enabled private VLAN feature for the selected fabric.
Private Network Type	Specifies the VLAN type. Select one of the following options: ▪ **Primary** - Select the option to configure your network as the primary VLAN. You can configure only one primary VLAN in a PVLAN. ▪ **Community** - Select the option to configure a secondary VLAN to enable the hosts to communicate with each other as well as forward traffic to ports in the Primary VLAN. ▪ **Isolated** - Select the option to configure an isolated secondary VLAN that enables the hosts to only forward traffic to the ports in the primary VLAN.
Network Name	Specifies the name of the network. The network name should not contain any white spaces or special characters except underscore (_) and hyphen (-).
Layer 2 Only	Enables you to create a Layer 2 only network. This field is applicable only for primary VLANs.
Primary Network Name	Choose the name of the primary network from the list of configured primary networks. This field is applicable only when you are configuring a secondary VLAN.

Field	Description
VRF Name	Allows you to select the VRF that you have created for the fabric. When no VRF is created, this field appears as blank. If you want to create a new VRF, click **Create VRF**. The VRF name should not contain any white spaces or special characters except underscore (_), hyphen (-), and colon (:). This field is applicable only for primary VLANs.
Network ID	Specifies the layer 2 Virtual Network Identifier (VNI) of the network.
VLAN ID	Specifies the corresponding tenant VLAN ID for the network. If you want to propose a new VLAN for the network, click **Propose VLAN**.
Network Template	Auto-populates the universal template for primary networks. For secondary networks, select the **Pvlan_Secondary_Network** template. This is only applicable for leaf switches.
Network Extension Template	Auto-populates the universal extension template for primary networks. For secondary networks, select the **Pvlan_Secondary_Network** template. This allows you to extend the network to another fabric. The VRF Lite extension is supported. The template is applicable for border leaf switches.

5. When you have entered all the necessary information in the configuration fields, click **Create**.

   The table in the **Networks** tab displays all the newly created PVLAN networks.

What's next: Once you have primary and secondary networks configured, you can attach the networks to the switches.

Attach a primary network

After creating the primary and secondary networks, you can attach the networks to the switches and their PVLAN interfaces. You can attach a primary network either explicitly or implicitly.

- **Explicit Attach/Detach** - Defines the method of manually attaching/detaching a network.
- **Implicit Attach/Detach** - Defines the method in which a network is attached/detached automatically because one of the members in a PVLAN primary-secondary pair undergoes an explicit attachment/detachment.

This section is optional for VTEPs that only have PVLAN host or trunk secondary ports. If you want to perform an implicit attach for your primary network, you can skip the section and proceed to

[Attaching a Secondary Network].

Perform the following steps to attach a primary network explicitly.

1. In Cisco Nexus Dashboard, choose **Manage > Fabrics**.
2. From the list of available fabrics, double-click the PVLAN-enabled fabric.

   The **Fabric Overview** page appears.

3. Navigate to the **Networks** tab and double-click the primary network to open the **Network Attachments** page.
4. On the **Network attachments** tab, select the required networks and choose **Actions > Edit**.

   The **Edit Network Attachment** page opens.

   The table under **Available Interfaces for this device** displays all the promiscuous ports and the promiscuous trunk ports available in the device. Note that for a primary PVLAN network, only the promiscuous ports and the promiscuous trunk ports are displayed.

   If you have ToR switches connected to the device, the pvlan interfaces on TOR switch will be displayed. If you select any TOR interface, the system adds PVLAN configuration to the TOR switch.

5. Use the toggle button to enable **Attach** and then click **Save**.
6. On the **Networks** tab, select the network and choose **Actions > Deploy**.

Attach a aecondary network

Perform the following steps to explicitly attach a secondary network.

1. In Cisco Nexus Dashboard, choose **Manage > Fabrics**.
2. From the list of available fabrics, double-click the PVLAN-enabled fabric.

   The **Fabric Overview** page appears.

3. Navigate to the **Networks** tab and double-click the secondary network to open the **Network Attachments** page.
4. On the **Network attachments** tab, select the required networks and choose **Actions > Edit**.

   The **Edit Network Attachment** page opens.

   The table under **Available Interfaces for this device** displays all the ports of type host and trunk secondary. For a secondary PVLAN network, only the host ports and the trunk secondary ports are displayed. Both community and isolated PVLAN ports are labeled as PVLAN host ports. A PVLAN host port is either a community PVLAN port or an isolated PVLAN port depending on the type of secondary VLAN with which it is associated.

   If you have ToR switches connected to the device, the pvlan interfaces on TOR switch will be displayed. If you select any TOR interface, the system adds PVLAN configuration to the TOR switch.

   Note that you cannot attach an interface group to a secondary network.

5. Use the toggle button to enable **Attach**, and then click **Save**.

   If you have not already performed an **Attach** for your primary network, the system automatically attaches the primary network along with the secondary network. You can view the network status for both the primary and the secondary networks in the **Networks** tab of the **Fabric Overview** window.

   When a secondary network is attached to a switch, it implicitly attaches to the other switches where its primary network is in explicit attach state, if the secondary network is not already attached.

6. On the **Networks** tab, select the network and choose **Actions > Deploy**.

Explicit and Implicit detach

The steps to detach a network are similar to the steps for attaching a network. The following points describe how implicit and explicit detach feature works.

- When you detach a primary network in explicit state, the following occurs:
  - If there is no secondary network in explicit state on the switch, the primary network is detached along with all the associated secondary networks
  - If there is any secondary network in explicit state, the primary network does not detach but changes to implicit state
- When you detach a secondary network explicitly, the primary network detaches automatically (implicitly) if the following conditions are met:
  - If the primary network is in implicit attached state
  - If the detached secondary is the only secondary network for this primary network on this switch
  - If no other switch in the fabric has this secondary in explicit attach state, this secondary network also gets detached from the other switches

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